

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference P2003,0182WO	FOR FURTHER ACTION See item 4 below	
International application No. PCT/DE2004/000333 ✓	International filing date (<i>day/month/year</i>) 23 February 2004 (23.02.2004) ✓	Priority date (<i>day/month/year</i>) 26 March 2003 (26.03.2003) ✓
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant OSRAM OPTO SEMICONDUCTORS GMBH ✓		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input checked="" type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).

Date of issuance of this report
22 February 2006 (22.02.2006)

Authorized officer

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Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

Translation

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

-(PCT Rule 43bis.1)

To:

Date of mailing
(day month year)

Applicant's or agent's file reference

P2003,0182WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/DE2004/000333 ✓

International filing date (day month year)

23.02.2004 ✓

Priority date (day month year)

26.03.2003 ✓

International Patent Classification (IPC) or both national classification and IPC

Applicant

OSRAM OPTO SEMICONDUCTORS GMBH ✓

1. This opinion contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input checked="" type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA EP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2004/000333 ✓

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(h)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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INTERNATIONAL SEARCHING AUTHORITY

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Box No. II

Priority

1. ☒ The following document has not yet been furnished:☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date in the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/DE2004/000333

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims

1-5, 7, 9, 10

YES

NO

Inventive step (IS)

Claims

6, 8

YES

NO

Industrial applicability (IA)

Claims

1-10

YES

NO

2. Citations and explanations:

1. In the present opinion, reference is made to the following documents:

D1: US 2002/071464 A1 (HALL ERIC M ET AL)

13 June 2002 (2002-06-13)

D2: SUGIMOTO M ET AL: "SURFACE EMITTING DEVICES WITH DISTRIBUTED BRAGG REFLECTORS GROWN BY HIGHLY PRECISE MOLECULAR BEAM EPITAXY" JOURNAL OF CRYSTAL GROWTH, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, Vol. 127, No. 1/4, 2 February 1993 (1993-02-02), pages 1-4, XP000441040 ISSN: 0022-0248

2. The present application does not fulfil the requirements of **PCT Article 33(1)** because the subject-matter of claim 1 is not novel under **PCT Article 33(2)**.

- 2.1 Document D1 (cf. figures 1, 3, 10; page 3, section 45 - section 50) discloses (the references in parentheses relate to this document) a

semiconductor laser (10), comprising at least one

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2004/000333_U

Box No. V

Reasoned statement under Rule 43bis.1(a)(b) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

absorbing layer ("top surface contact layers" of 12a and 12b; 16) within the laser resonator, said absorbing layer reducing transmission of the laser beam in the laser resonator so as to decrease sensitivity of the semiconductor laser to disturbances created by radiation that is fed back into the laser resonator,

that is to say that document D1 anticipates the subject-matter of claim 1.

2.2 Observations:

a) The functional specification "said absorbing layer reducing transmission of the laser beam in the laser resonator so as to decrease sensitivity of the semiconductor laser to disturbances created by radiation that is fed back into the laser resonator" in claim 1 instead of a definition of the technical features of the absorbing layer in the laser resonator permits doubt with regard to the scope of protection of this claim (PCT Article 6). It is pointed out, however, that the contact layers or the tunnel junction in D1 are likewise arranged in such a way that they reduce the sensitivity of the semiconductor laser to disturbances created by the radiation that is fed back into the laser resonator.

b) The expression "radiation that is fed back" in claim 1 does not have the meaning that it normally has in this field. It ought to have been replaced by "radiation that is reflected or scattered back from external objects into the semiconductor laser" (see description page 1, paragraph 4).

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/DE2004/000333

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

c) The subject-matter of the present claim 1 is anticipated in principle by all semiconductor lasers comprising a layer that absorbs the laser radiation within the resonator, thus e.g. layers having a high charge carrier density, saturable absorbers, photodetectors, modulators, etc.; also see the documents cited in the International Search Report and the corresponding passages.

3.1 Dependent claims 2-5, 7, 9 and 10 do not contain any features which, in combination with the features of any claim to which they refer, meet the PCT requirements for **novelty**. Document D1 anticipates the subject-matter of claims 2-5, 9 and 10, and document D2 (cf. figure 4 and associated description) anticipates the subject-matter of claims 2, 3, 5, 7 and 10.

3.2 Dependent claims 6 and 8 do not contain any features which, in combination with the features of any claim to which they refer, meet the PCT requirements for **inventive step**.

4. Observations:

i) The essential features of the invention should be able to be understood without reference back to other documents. The content of the description should be unambiguous, thus including paragraph 2 of page 1 of the description (cf. PCT International Search and Preliminary Examination Guidelines 4.26 and 4.27).

ii) Under PCT Article 6, the scope of protection of

WRITTEN OPINION OF THE
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International application No.

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Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
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the invention is defined in the patent claims,
contrary to the explanations in the last paragraph
on page 8 of the description.